Amendments to the Drawings:

The attached replacement sheets of drawings includes changes to Figs. 1, 3 and 7 and replaces the original sheet including Figs. 1, 3 and 7.

In Figure 1, applicant replaced the reference "D_2" with "D_z", replaced the word "PROGRESS" appearing in item 12 with "PROCESS", and added a the descriptors "PULSE GENERATORS" and "CONTROLLER" to items 53 and 55, respectively, within item 12 .

In Figure 3, applicant added the reference numeral 62 to the transformer coupled to receiver line 28.

In Figure 7, applicant amended the drawing to switch reference numerals 324 and 326 so that the corresponding items are marked in a manner consistent with the Description of the above-identified application.

Attachments following last page of this Amendment:

Replacement Sheet (3 pages)
Annotated Sheet Showing Change(s) (3 pages)

REMARKS

Claims 1-17 are pending. Claims 1, 7 and 12 are independent.

Applicant acknowledges with thanks the examiner's indication that claims 4, 10 and 15 would be allowable if rewritten in independent form.

The examiner objected to the drawings of FIGS. 1, 3 and 7 under 37 C.F.R. § 1.84(p)(5). In response, applicant amended the drawings to make the corrections requested by the examiner.

Applicant amended independent claim 1 to correct a typographical error.

The examiner rejected claims 1, 6, 7, 12 and 17 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,992,553 to Morrison. The examiner also rejected claims 2, 8, 13 under 35 U.S.C. § 103(a) as being unpatentable over Morrison in view of U.S. Patent No. 4,839,650 to Geen et al. The examiner further rejected claims 3, 9, 14 under 35 U.S.C. § 103(a) as being unpatentable over Morrison in view of Geen and further in view of U.S. Patent No. 3,774,206 to Rauch. Additionally, the examiner rejected claims 5, 11 and 16 under 35 U.S.C. § 103(a) as being unpatentable over Morrison in view of Geen and further in view of U.S. Patent Publication No. 2004/0170428A1 to Barker et al.

Specifically, the examiner stated with respect to independent claim 1:

> With respect to claims 1, 7, and 12, Morrison teaches a method for discovering a power level in a diode discovery circuit (col 1, ln 23-24; col 3, ln 24-25, ln 27-33; col 5, ln 54-57) comprising:
> ...
> applying power in response to comparing the transmitted pulse signal to the received pulse signal and measuring the time (col 3, ln 28-33, ln 62-64; col 4, ln 29-30; col 7, ln 59-64). (Office Action, paragraph 5, pages 3-4)

Applicant respectfully disagrees. Independent claim 1 recites "applying power in response to comparing the transmitted pulse signal to the received pulse signal and to measuring the time." As explained in applicant's originally filed application, in one embodiment a network device, referred to as a Data Terminal Equipment (DTE), facilitates its detection by using a diode circuit that is coupled to its input terminals (see, for example, FIG. 1). Applicant's method detects the presence of the DTE by sending a pulse signal, receiving the transmitted signal, and comparing the transmitted and received signals. The comparison of transmitted and received

signal enables applicant's method to determine if a diode is present on the lines, which in turn indicates that a DTE is likewise present. As more particularly described in the originally filed application:

> **The circuit 10 uses the conductance characteristics of a diode. The device 12 attempts to send a positive and negative voltage pulse through a diode. One of the attempts will be successful since the diode will turn on and conduct whereas the other attempt will fail since the diode will be reversed biased and will not conduct. The discovery process device 12 is used to both send and receive pulses and thus knows when it should and should not receive pulses. If a line 20,28 is not correctly terminated in a diode, the device 12 can detect the incorrect termination. A short circuit will pass both polarities of pulses while an open circuit will pass no pulses. As configured, a positive pulse from node n2 16 of the discovery process device 12 will pass through the capacitor 18 and line 20 to n4 22. A diode D1 24 will become forward biased and pass the pulse to n3 26. The pulse will continue on through the other line 28 and capacitor 30 to node n1 32 where it will be detected by the discovery process device 12. On the other hand, a positive pulse from node n1 32 will be blocked at the diode 24. (page 3, lines 3-20)**

If the technique detects the presence of a diode, and thus the presence of a DTE, power may be applied to the DTE.

In contrast, Morrison describes a power augmentation device for a human powered vehicle (e.g., a bicycle) which permits the human to maintain a desired maximum power output under varying conditions of load, wind and slope (col. 3, lines 6-9). As explained by Morrison, "a control system 61 for controlling auxiliary power to a bicycle includes a pedal force measurement 62 which produces a signal related to the force applied to a bicycle pedal by a cyclist" (col. 6, lines 9-12). The pedal force signal is transmitted to a controller 66 which uses the received signal to compute a set-point value that is communicated to the drive motor 40 (col. 6, lines 20-23).

Thus, although Morrison's pedal force measurement module 62 of the control system 61 transmits a signal that is subsequently used to determine the bicycles auxiliary power requirements, Morrison's control system does not perform a comparison of the signal it transmitted and what Morrison's control system received back. Indeed, Morrison's control system does not have to determine if a particular device or system (e.g., network device) is present, and therefore it does not have to send a signal and compare it to what it receives back to

determine what, if anything, is connected to the transmission lines. Accordingly, Morrison does not disclose or suggest at least "applying power in response to comparing the transmitted pulse signal to the received pulse signal and to measuring the time," as required by independent claim 1. Applicant's independent claim 1 is therefore patentable over the cited art.

Rejected claims 2-3 and 5-6 depend from independent claim 1 and are therefore patentable for at least the same reasons as independent claim 1.

Independent claims 7 and 12 recite "apply power in response to comparing the transmitted pulse signal to the received pulse signal and to the measured time," or similar language. For reasons similar to those provided with respect to independent claim 1, at least this feature is not disclosed by the cited art. Accordingly, independent claims 7 and 12 are patentable over the cited art.

Rejected claims 8-9 and 11 depend from independent claim 7 and are therefore patentable over the cited art for at least the same reasons as independent claim 7. Rejected claims 13-14 and 16-17 depend from independent claim 12 and are therefore patentable for at least the same reasons as independent claim 12.

Additionally, as noted above, the examiner rejected claims 2, 8 and 13 under 35 U.S.C. § 103(a) as being unpatentable over Morrison in view of Geen. Specifically, the examiner stated:

> Morrison teaches all the limitations of parent claim 1 as described above, but does not teach the pulse signal including a pseudo random generated 11-bit word. Geen et al. teaches a pseudo random binary sequence in the form of an 11-bit shift register (col 3, ln 40-42). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Morrison to include the pseudo random word of Geen et al. because the pseudo random word reduces the quantization error for data being sent (Geen et al.: abstract, ln 17-18). (Office Action, paragraph 7, pages 4-5)

Applicant's claim 2 further limits claim 1, and recites that the pulse signal includes a pseudo random generated 11-bit word. Applicant contends that no motivation exists for combining Morrison with Geen.

Geen describes an analog-to-digital converter apparatus that reduced quantization error by adding to the analog signal to be converted a dither signal (Abstract and col. 2, lines 38-47). The dither signal is derived by a dither signal generator that includes a five bit counter to produce the digital version of the dither signal. A digital-to-analog converter is used to convert the digital signal into the analog dither signal added to the input signal that is to be digitized (col. 3, lines 35-40). Geen also describes that:

> **The quantization error, ie the resolution error related to the ideal A/D transfer function and comprising uniformly distributed inaccuracies of plus or minus one half the magnitude represented by the least significant A/D output bit, is reduced by the random component of the dither signal added to the sampled signals and the subsequent effective averaging of samples in memory 14. As is known, this technique gives an effective improvement in the converter resolution. (Geen, col. 6, lines 42-50)**

The dither signal, which includes the random component, is added to the input signal to reduce the quantization error that forms when the analog input signal is digitized by the analog to digital converter.

As explained above, Morrison's control system produces a signal related to the force applied to a bicycle pedal by a cyclist, which is then used to generate a control signal to drive motor 40. Particularly, Morrison explains:

> **Referring now to FIG. 5, the primary input device to pedal force measurement 62 is preferably a force-variable resistor 67 whose resistance varies inversely with the compression thereof resulting from forces applied thereto. Such force-variable resistors are well known in the art. In their simplest embodiment, force-variable resistors consist of graphite-doped rubber or suitable polymer.**
>
> **A voltage V, is applied through force-variable resistor 67 to a junction of a capacitor 68 and one input of a comparator 70. A reference voltage Vref is applied to the other input of comparator 70. A transistor 72 has its collector connected to the first input of comparator 70. A one-shot multivibrator 74 receives the output of comparator 70. A short pulsed output of one-shot multivibrator 74 is applied to the base of transistor 72 to short circuit and discharge capacitor 68, while providing an output to a transmitter 76. The reference voltage Vref establishes the threshold voltage level at which one-shot multivibrator 74 is triggered. The time require to charge capacitor 68 to a voltage equal to Vref depends on the resistance of force-variable resistor 67. This charge time is thus also inversely related to the applied force. Accordingly, the pulse repetition frequency of pulses generated by**

pedal force measurement 62 is directly related, in a known manner, to the applied pedal force. (Morrison, col. 6, lines 42-65)

Morrison describes the signal that is transmitted to control the motor as short pulsed signals from a one-shot multivibrator 74 whose pulse repetition frequency is indicative of the force applied to the bicycle pedal by the cyclist (see also Morrison, col. 7, lines 6-13). The information regarding the force applied to the bicycle pedal is encoded in the pulse repetition frequency of the pulse signal. It would be entirely unnecessary to perform any sort of analog-to-digital or digital-to-analog processing on Morrison's transmitted signal, since the conversion of the pedal force signal is provided by the one-shot multivibrator.

Morrison does not suggest the use of an analog to digital convert to produce the signal that is transmitted to the non-rotating part of the bicycle. Morrison accomplishes conversion of the force of the pedal into a signal by the multi-vibrator. Hence, it would be entirely unnecessary to add to that signal a dither signal that includes a random component since there is no quantization error caused by use of an analog to digital converter that needs to be reduced. Accordingly, there exists no motivation or suggestion for a person of ordinary skill in the art to modify the teaching of Morrison to include the pseudo random word of Geen.

Furthermore, adding a random number component to Morrison's signal would produce a resultant signal having a frequency and/or amplitude different than the initial signal produced by Morrison's one-shot multivibrator. This in turn would skew the information transmitted by the signal produced by Morrison's one-shot multivibrator, thereby resulting in the motor 40 applying a non-suitable auxiliary power to the bicycle. Thus, adding a random number component to Morrison's signal would render Morrison unsatisfactory for its intended purpose and/or change the principle of operation of Morrison.

Moreover, applicant notes that there would be no motivation or suggestion to combine Morrison and Geen given their disparate technological fields. Whereas Morrison is directed to a system to applied auxiliary power to a bicycle to maintain it at a desired maximum power output, Geen is directed to a signal processing apparatus intended to reduce quantization error resulting from analog-to-digital signal conversion. Applicant contends that it is unlikely that a person of ordinary skill who is aware of Morrison's teachings would then consider the Geen, relating to an entirely different technological field, and combine the two.

Since no suggestion or motivation exists for combining Morrison and Geen, the examiner has thus failed, with respect to claims 2, 8 and 13, to establish a *prima facie* case of obviousness. Accordingly, applicant's claims 2, 8 and 13 are patentable over the cited art.

Rejected claims 3 and 5, 9 and 11, and 14 and 16 depend from claims 2, 8 and 13, respectively. Rejected claims 3 and 5, 9 and 11, and 14 and 16 are therefore patentable for at least the same reasons that claims 2, 8 and 13, respectively, are patentable.

It is believed that all the rejections and/or objections raised by the examiner have been addressed.

All of the dependent claims are patentable for at least the reasons for which the claims on which they depend are patentable.

Canceled claims, if any, have been canceled without prejudice or disclaimer.

Any circumstance in which the applicant has (a) addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.

Please apply any other charges or credits to deposit account 06-1050, referencing attorney docket No. 10559-683002.

Respectfully submitted,

Date: April 10, 2006

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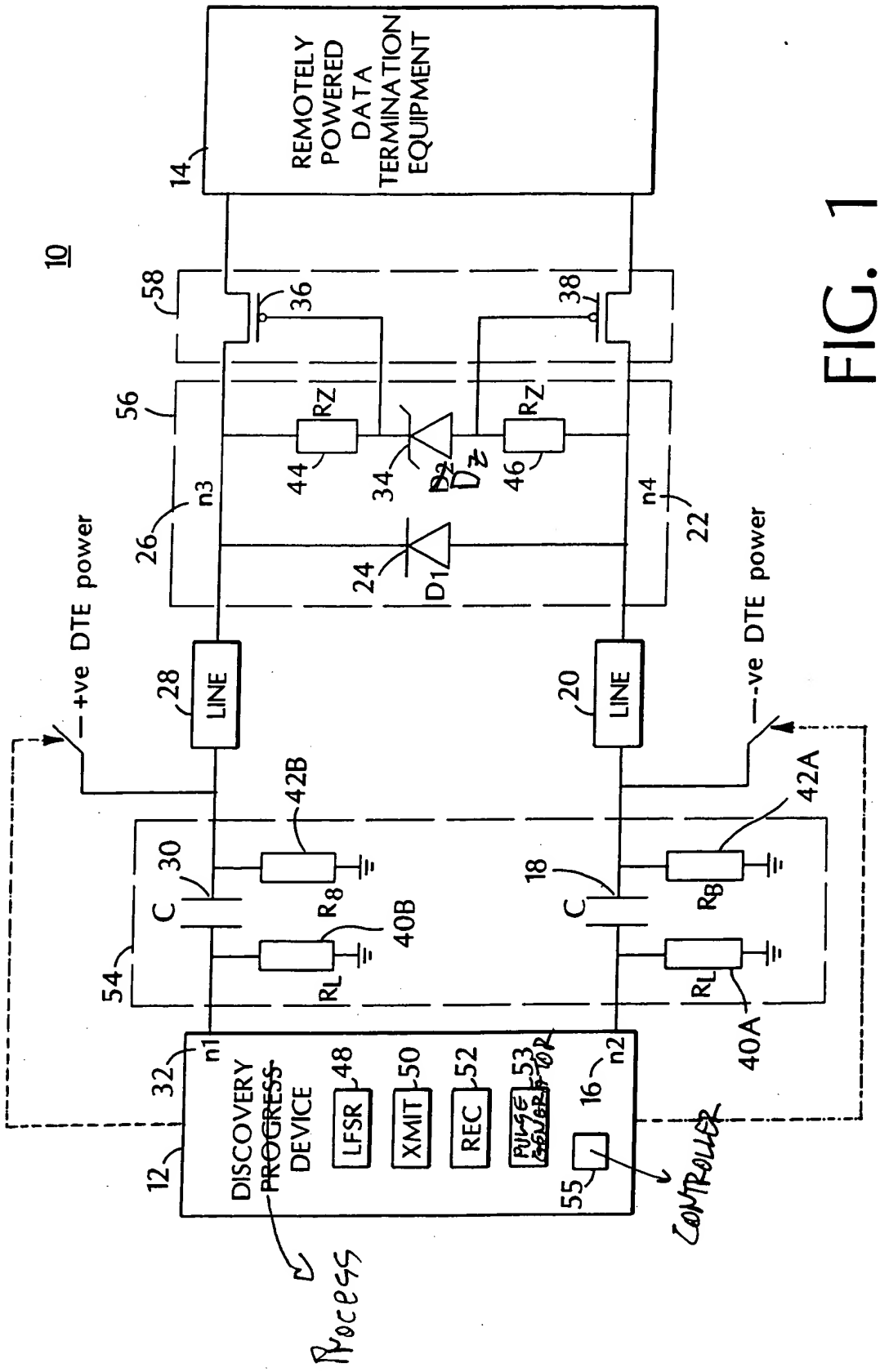

FIG. 1

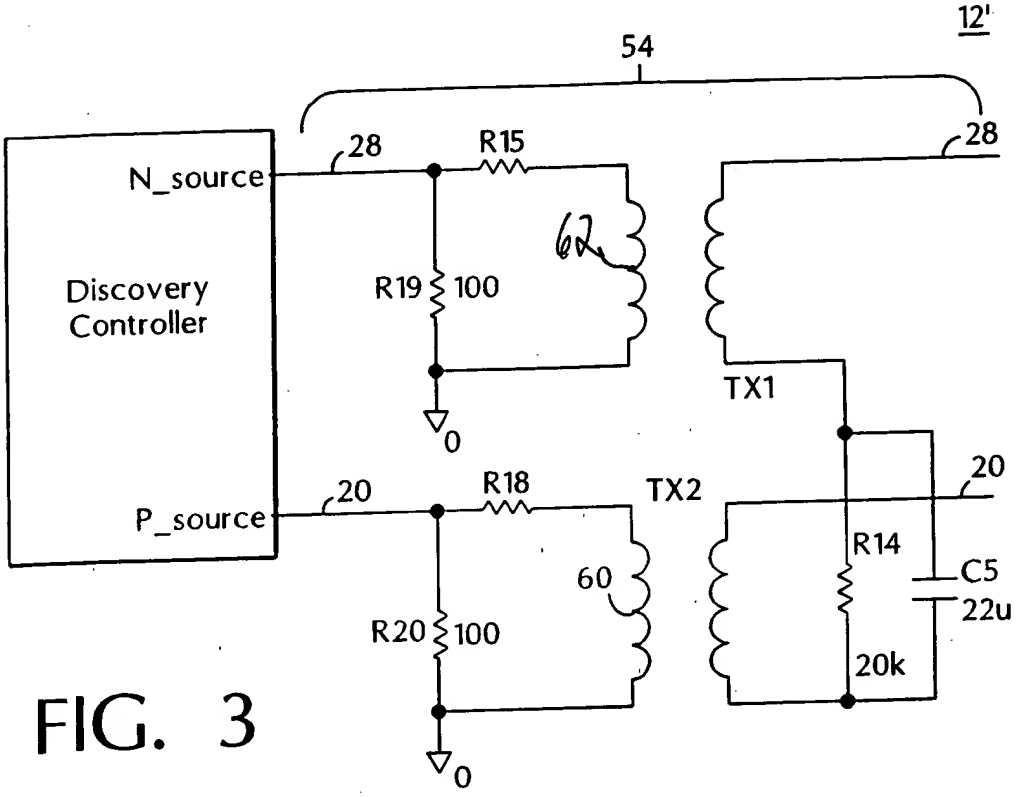
12'
54
28
R15
28
N_source
62
Discovery
Controller
R19
100
TX1
0
20
R18
TX2
20
P_source
R14
C5
22u
60
R20
100
20k
0

FIG. 3

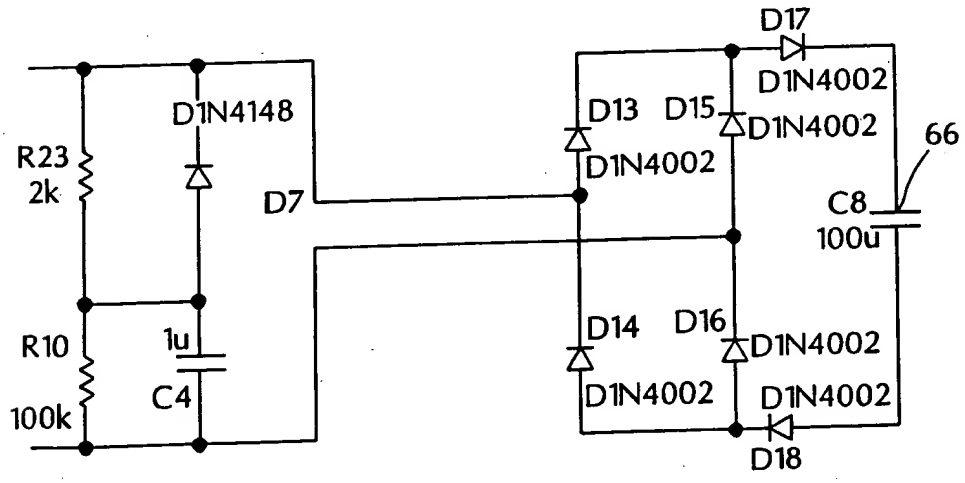
D17
D1N4002
D1N4148
D13
D15
D1N4002
66
R23
2k
D1N4002
D7
C8
100u
R10
1u
D14
D16
D1N4002
100k
C4
D1N4002
D1N4002
D18

FIG. 4

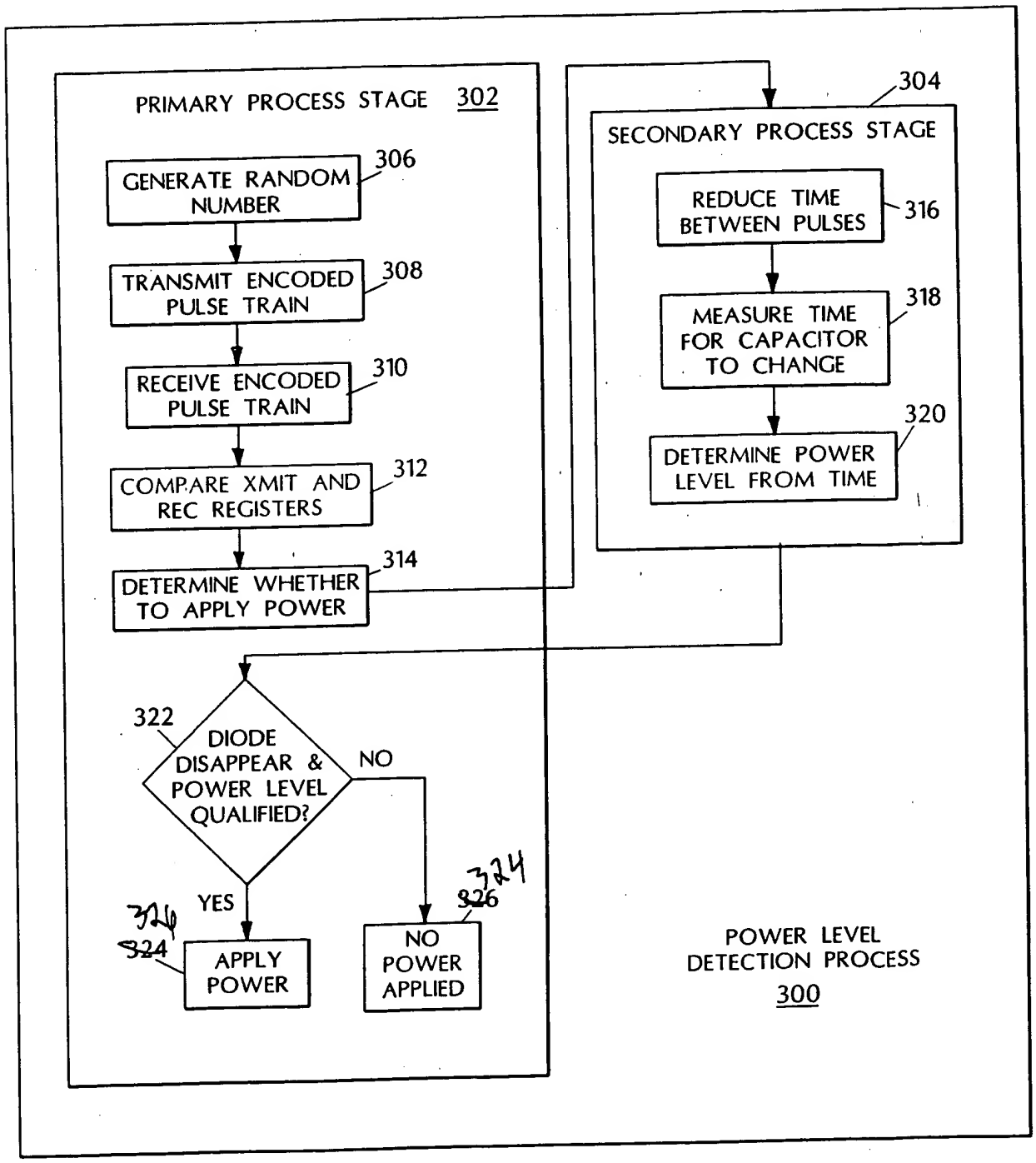
PRIMARY PROCESS STAGE 302
GENERATE RANDOM NUMBER
306
TRANSMIT ENCODED PULSE TRAIN
308
RECEIVE ENCODED PULSE TRAIN
310
COMPARE XMIT AND REC REGISTERS
312
DETERMINE WHETHER TO APPLY POWER
314
304
SECONDARY PROCESS STAGE
REDUCE TIME BETWEEN PULSES
316
MEASURE TIME FOR CAPACITOR TO CHANGE
318
DETERMINE POWER LEVEL FROM TIME
320
322
DIODE DISAPPEAR & POWER LEVEL QUALIFIED?
NO
YES
324
APPLY POWER
326
NO POWER APPLIED
POWER LEVEL DETECTION PROCESS
300

FIG. 7